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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/028,766	12/28/2001	Satoshi Shimizu	216780US-2 DIV	4292

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OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER

NGUYEN, CUONG QUANG

ART UNIT	PAPER NUMBER
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2811

DATE MAILED: 10/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/028,766

Applicant(s)

SHIMIZU ET AL.

Examiner

Cuong Q Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 10-13 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 10-13 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other: ____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 10 is rejected under 35 U.S.C. 102(e) as being anticipated by Matsubara (US 6,096,638).

Matsubara discloses a MIS transistor device comprising: a silicon substrate (101); a gate electrode formed over the substrate through a gate insulating film (103); first sidewalls (105) being insulative and being formed on the substrate on both sides of the gate electrode, wherein the gate electrode including: a silicon film (104) formed on the gate insulating film and a silicide film (109) formed on a surface of silicon film, wherein the silicon film having second sidewalls, wherein silicide film having a plane portion held between second sidewalls, and wherein the first sidewalls and second sidewalls being higher than the plane portion of the silicide film. See Matsubara's Fig.1D and Fig.1E.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsubara in view of Lur et al. (US 5,554,566).

Matsubara teaches all limitations of claim 10 as shown above, However, Matsubara does not teach that a surface of the gate electrode being roughened.

Lur et al. discloses a transistor device comprises a surface (6B) of a gate electrode (4) having a roughness surface. See Lur et al.'s Fig.2.

It would have been for one ordinary skill in the art to incorporate the gate electrode having a roughness surface as taught by Lur et al. into Matsubara's device in order to improve adhesion (reducing peeling phenomena) between the poly gate and the silicide layer. This rough surface also allows a less stress interface to be produced. See Lur et al.'s col.2 lines 1-8.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mathews et al. in view of Mogami (US 5,656,519).

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Mathews et al. discloses a MIS transistor device comprising: a silicon substrate (15) having a main surface; a gate insulating film (16) formed on the substrate; a gate electrode (11) formed on the gate insulating film and having a silicified portion (12) at an opposite side of gate insulating film; a pair sidewalls formed on the main surface on both sides of gate electrode and having L-shape sections (42) being higher than the silicified portion (12); and impurity regions (source/drain regions 44) formed inside the main surface to be opposed to gate electrode in regard to sidewalls. See Mathews et al.'s Fig.1.

Mathews et al. does not teach that source/drain regions have a silicified surface.

Mogami discloses a MIS transistor comprising: source/drain regions (10 and 11) having silicified surfaces (13b). See Mogami's Fig.5F.

It would have been obvious to one of ordinary skill in the art to form source/drain regions including silicified surface as taught by Mogami into Mathews et al.'s device in order to reduce the parasitic resistances of the source/drain regions of MIS transistor. See Mogami's col.1 lines 23-30.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mathews et al. in view of Mogami and further in view of Lur et al. (US 5,554,566).

Mathews et al. and Mogami teaches all limitations of claim 10 as shown above, However, Mathews et al. and Mogami do not teach that a surface of the gate electrode being roughened.

Lur et al. discloses a transistor device comprises a surface (6B) of a gate electrode (4) having a roughness surface. See Lur et al.'s Fig.2.

It would have been for one ordinary skill in the art to incorporate the gate electrode having a roughness surface as taught by Lur et al. into device being formed by the combination of Mathews et al. and Mogami in order to improve adhesion (reducing peeling phenomena) between the poly gate and the silicide layer. This rough surface also allows a less stress interface to be produced. See Lur et al.'s col.2 lines 1-8.

Response to Arguments

3. Applicant's arguments with respect to claims 12-13 filed 7-30-03 have been fully considered but they are not persuasive.

Applicants argue that the teachings of Mogami (the silicide layer on the source/drain region) can not incorporate into Mathews because these two references are using two different methods. In response, it is noted that this application is a device application and the patentability is given to the structure limitations not method limitations, so one of ordinary skill in the when incorporates the silicon layer on source/drain region of Mathews' device could use any method and it is not necessary using the method as taught by Mogami.

4. Applicant's arguments with respect to claims 10-11 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

6. Papers related to this application may be submitted to Technology center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the TC 2800 Fax center located in Crystal Plaza 4, room 4-C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Group 2811 Fax Center number is (703) 872-9306. The Group 2811 Fax Center is to be used only for papers related to Group 2811 applications.

7. Any inquiry concerning this communication or any earlier communication from the Examiner should be directed to CUONG Q NGUYEN whose telephone number is

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(703) 308-1293. The Examiner is in the Office generally between the hours of 6:30 AM to 5:00 PM (Eastern Standard Time) Monday through Thursday.

8. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor Eddie Lee who can be reached on (703) 308-1690. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

9. Any inquiry of a general nature or relating to the status of this application should be directed to the Technology Center Receptionists whose telephone number is 308-0956.

A handwritten signature in black ink, appearing to read 'Cuong Nguyen', with a long, sweeping underline that extends down towards the title 'Primary examiner'.

Cuong Nguyen

Primary examiner

10/19/03